

**To:** Miller, Ken[kenneth.miller@wustl.edu]  
**From:** Avey, Lance  
**Sent:** Fri 1/15/2016 3:35:33 PM  
**Subject:** FW: Ameren modeling information for Labadie

Hi Ken,

I was going to pass this along to you earlier. But this will be good to know for our talk today.

Lance Avey

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**From:** Wilbur, Emily [mailto:emily.wilbur@dnr.mo.gov]  
**Sent:** Monday, December 21, 2015 1:58 PM  
**To:** Avey, Lance <Avey.Lance@epa.gov>  
**Cc:** Hawkins, Andy <hawkins.andy@epa.gov>; Keas, Ashley <Ashley.Keas@dnr.mo.gov>  
**Subject:** RE: Ameren modeling information for Labadie

Hi Lance,

This was one of the questions we had early on about using actual emissions data: fixed vs. standard vs. actual flows. If there is a preference, please let us know for future reference.

Here is the information we obtained from Ameren about how the actual flows were calculated:

The flows used are those that are reported to the CAMD system. These flows are in standard cubic feet per hour (scfh) which represents a temperature of 68 Deg F. We converted these flows to actual cubic feet per hour (acfh) using actual measured temperature in the stack assuming constant pressure. That is

$$V_a = T_a * V_s / T_s$$

Where

$V_a$  – acfh

$V_s$  – scfh

$T_a$  – actual stack temperature (absolute Rankin or Kelvin)

$T_s$  – standard stack temperature (absolute Rankin or Kelvin)

Velocity at stack top then based on stack exit area based on 20.5 ft diameter.

Combining flues:

- 1) Emission rate: The emission rate for Unit 3 and Unit 4 were summed.
- 2) Temperature: The combined temperature for Units 3 and 4 was calculated from the weighted average of the (Unit 3 temperature \* Unit 3 velocity) + (Unit 4 temperature \* Unit 4 velocity) / (Unit 3 velocity + Unit 4 velocity)
- 3) Velocity: The combined velocity for Units 3 and 4 was calculated from the sum of the Unit 3 and 4 velocities \* (pi \* (6.25 (single flue diameter)^2) / (pi \* 8.84 (equivalent dual flue diameter)^2)

Please let me know if you have any questions.

Thanks,

Emily

**From:** Avey, Lance [<mailto:Avey.Lance@epa.gov>]  
**Sent:** Friday, December 18, 2015 8:53 AM  
**To:** Wilbur, Emily  
**Cc:** Hawkins, Andy  
**Subject:** Ameren modeling information for Labadie

Hi Emily,

As we continue to evaluate the sets on modeling inputs we have received for Labadie for 1-hr SO<sub>2</sub>, we are seeing some differences in the modeled inputs, like the exit velocities used. Could you supply the calculation methodology for the exit velocities for the Ameren values and have them include all hourly parameters that were used in their calculation?

Thanks much,

Lance

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